

Permeabilnostni indeks pri bolnikih s celiakijo

Permeability index in celiac disease patients

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Glavna funkcija tankega črevesja je prebava črevesne vsebine, absorpcija hranil in elektrolitov ter vzdrževanje vodne homeostaze. Tanko črevo ima zelo pomembno vlogo kot pregrada med človeškim organizmom in zunanjim okoljem. Mehanizem pregrade omogoča selektivno prepustnost za makromolekul. Nekatere bolezni imajo pomemben vpliv na celovitost tankega črevesja, tako se ta razlikuje, če primerjamo zdravo populacijo z bolniki s celiakijo. Zaradi izravnave črevesne sluznice in sprememb tesnih stikov med enterociti kot posledice vnetja, imajo ljudje s celiakijo običajno višje vrednosti permeabilnostnega indeksa v urinu. Višje vrednosti so posledica večje absorpcije laktuloze zaradi sprememb tesnih stikov med eritrociti in šibke absorpcije manitola zaradi izravnave sluznice.

The primary function of the small intestine is the digestion of the intestinal contents, the absorption of nutrients and electrolytes and water homeostasis maintenance. However, small intestine has a very important role as a barrier between the human organism and the external environment. The mechanism of the barrier enables selective permeability for some macromolecules. Some diseases have an important influence on small intestine's integrity. The small intestine's integrity differs when comparing healthy people and people with Coeliac disease. Due to the intestinal mucosa level off and changes of tight junctions among enterocytes as a result of the inflammation, people with Coeliac disease express typically higher values of the permeability index in the urine. The higher values are the result of the intensively absorbed lactulose through modification in tight junctions among enterocytes and a weak absorption of mannitol due to the level off of intestinal mucosa.

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METODE

Permeabilnostni indeks je predlog za novo metodo, ki temelji na prepustnost tankega črevesa za dve molekuli različnih velikosti: manjše molekule manitola in večje molekule laktuloze. Naša skupina je bila sestavljena iz 10 bolnikov in 10 kontrol. Merili smo koncentracijo sladkorja v peturnem vzorcu urina po popitju raztopine, ki je vsebovala laktulozo in manitol. Permeabilnostni indeks je kvocient med koncentracijo laktuloze in manitola v urinu. Laktulozo in manitol v urinu smo merili z absorpcijsko spektroskopijo.

REZULTATI

Raziskava je pokazala, da so vrednosti permeabilnostnega indeksa signifikantno razlikujejo med obema skupinama. Specifičnost metode je 100 % in občutljivost 60 %. Vrednost AUC pri ROC krivulji je 0,990.

ZAKLJUČKI

Študija dokazuje, da je permeabilnostni indeks primerni marker prepustnosti tankega črevesja pri ljudeh s celiakijo. Spremenjena prepustnost za makromolekule je posledica sprememb v Zonulinski proteinski frakciji tesnih stikov in izravnavi vnete intestinalne sluznice. Kljub malemu vzorcu je možno zaključiti, da je permeabilnostni indeks pomemben potencialni diagnostični test pri bolnikih s celiakijo.

METHODS

The permeability index is a suggestion for a new method, based on small intestine's permeability for the two molecules of different sizes: the smaller molecule mannitol and the larger molecule lactulose. Our group consisted of 10 patients and 10 controls. We measured the concentration of sugars in five-hour urine samples after drinking a solution containing lactulose and mannitol. The permeability index is the quotient of the lactulose and mannitol concentrations. The principle of the detection of lactulose and mannitol in the urine was absorption spectroscopy.

RESULTS

The study shows that the values of the permeability index significantly differ between the two groups of the people. We assessed the diagnostic value (specificity, sensitivity) of the test and compared the results between groups with the ROC curve. The specificity of the method was 100 % and the sensitivity 60 %. The AUC value is 0,990.

CONCLUSIONS

The study proves that the permeability index is an appropriate marker of the small intestine's permeability when it comes to people with Coeliac disease. Different permeability is the consequence of changes in Zonulin protein fraction of tight junctions and result is different permeability for macromolecules. Despite the small samples of the study it can be concluded that the permeability index is an important potential diagnostic test when it comes to people with Coeliac disease.